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**WATER SUPPLY OUTLOOK  
FOR  
WASHINGTON**

U.S. DEPARTMENT OF AGRICULTURE  
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MAY 18 1970

U.S. DEPARTMENT OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE.

and  
DEPARTMENT of WATER RESOURCES STATE of WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, and other Federal, State and Private organizations.

AS OF  
MAY 1, 1970

## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

### PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80202
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Building, Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 340, Casper, Wyoming 82601

### PUBLISHED BY OTHER AGENCIES.

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P O Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia





# ***WATER SUPPLY OUTLOOK FOR WASHINGTON***

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

*Issued by*

**KENNETH E. GRANT**  
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SOIL CONSERVATION SERVICE  
WASHINGTON, D.C.

|||||

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STATE OF WASHINGTON

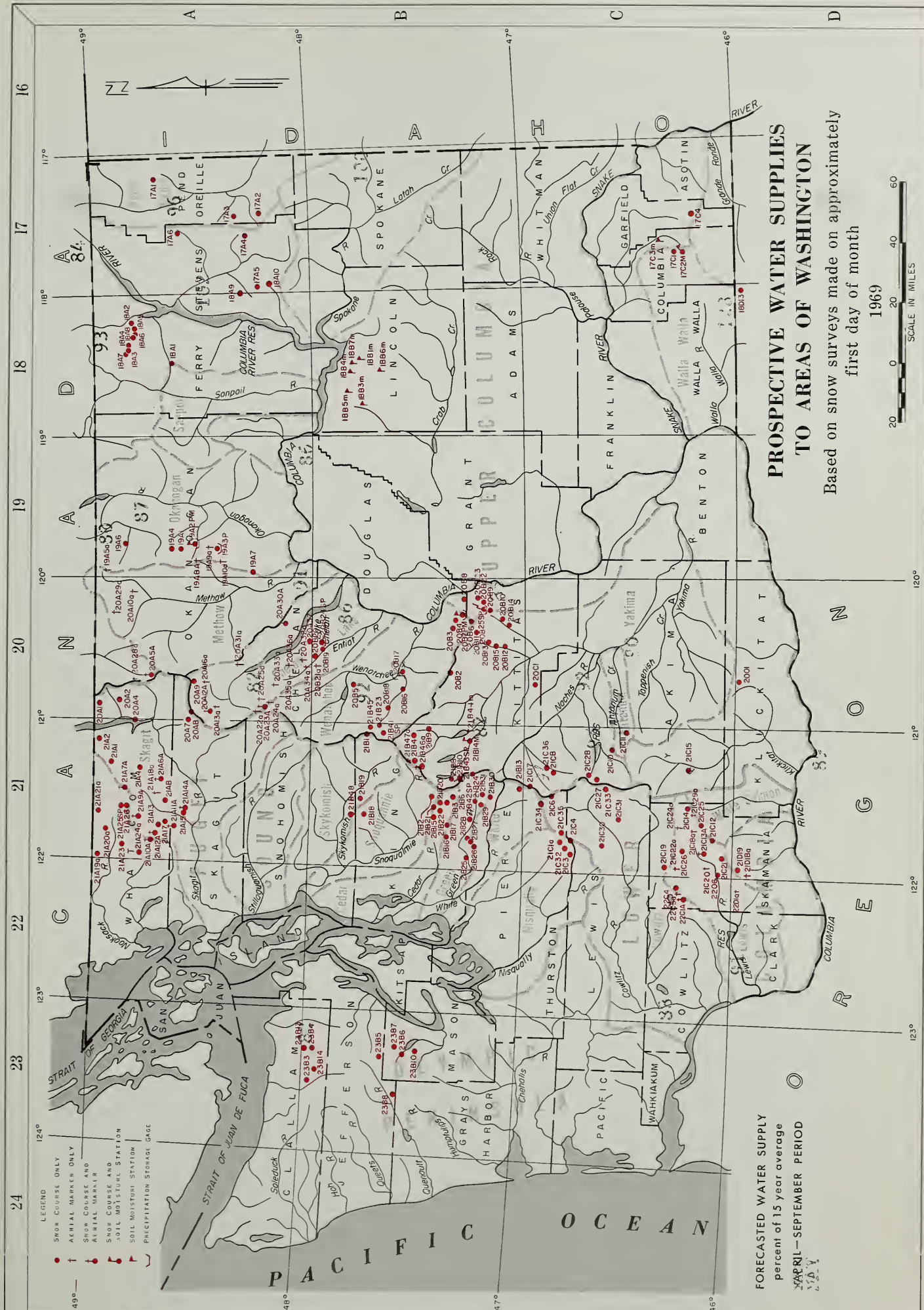
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*Report prepared by*

**ROBERT T. DAVIS, Snow Survey Supervisor**

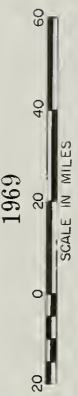
SOIL CONSERVATION SERVICE  
360 U.S. COURTHOUSE  
SPOKANE, WASHINGTON 99201





# PROSPECTIVE WATER SUPPLIES TO AREAS OF WASHINGTON

Based on snow surveys made on approximately  
first day of month  
1969



FORECASTED WATER SUPPLY  
percent of 15 year average  
APRIL—SEPTEMBER PERIOD  
1969



# INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

UPPER COLUMBIA DRAINAGE					LOWER COLUMBIA DRAINAGE					OLYMPIC PENINSULA					Snoqualmie River					Skykomish River									
NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
Pend Oreille River																													
Boyer Mountain	17A2	7	31N	43E	5550	Clockum Creek	20B3	12	21N	10E	4400	Divide Meadow	21C29a	21	9N	10E	5600	Skagit River	21A2	35	37N	12E	2200						
Bunchgrass Meadow	17A1	24	31N	42E	5000	Squillehook Creek	20B4	1E	21N	20E	3400	Longmire	21C25	21	8N	9E	3500	Beaver Pass	21A1	9	39N	12E	3680						
Minchester Creek	17A3	30	33N	43E	2970	Scout-A-Vista	20B4	1E	21N	20E	3400	Paradise Park (New)	21C26	8	9N	7E	3800	Devils Park	20A4	34	38N	14E	5900						
Kettle River																													
Boulder Road	18A2	36	39N	3E	1450	Stemilt Creek	20B4	1E	21N	20E	3400	Oldman Pass	21D19	22	6N	6E	2000	Freezout Creek Trail	20A1	14	40N	14E	3500						
Butte Creek	18A3	28	39N	35E	4070	Stemilt Slide	20B4	34	21N	20E	4450	Plains of Abraham	22G1a	35	9N	5E	4400	Freezout Meadows	20A2	8	40N	16E	5000						
Cabin Creek	18A4	5	38N	36E	3170	Upper Wheeler	20B4	30	21N	20E	5000	Smith Creek Road	22G2a	29	9N	6E	2100	Lake Horzween	21A2	19	40N	14E	2600						
Goet Creek	18A5	26	39N	35E	3595	Scout-A-Vista	20B4	1E	21N	20E	3400	Spencer Meadow	21C20a	16	8N	7E	3400	Meadows Cedins	20A8	29	37N	14E	1900						
Shoo Caps Creek	18A6	3	38N	36E	2150	Creston-Kunz	20B4	30	21N	20E	4400	Surprise Lakes	21C21a	20	9N	8E	4250	Thunder Basin	20A7	15	35N	14E	4200						
Shoo Caps Trail	18A7	5	38N	36E	2730	Jack woods	20B4	30	21N	20E	4400	Timbered Peak	21D18a	36	6N	6E	3000												
Summit G. S.	18A7	20	39N	35E	4600	Crab Creek	20B4	30	21N	20E	4400	Yakima River	21C11	26	12N	14E	3100												
Colville River																													
Enird	17A5	10	36N	42E	3215	Big Boulder Creek	21C11	26	12N	14E	3100	Chast Forest	21C4	23	15N	8E	4550												
Cerlison	18A9	34	32N	38E	2885	Bumping Lake	21C11	26	12N	14E	3100	Longmire	21C3	29	15N	8E	2760												
Chevelah	17A4	11	32N	41E	4925	Bumping Lake New	21C11	26	12N	14E	3100	Paradise Park (New)	21C35	13	15N	8E	5050												
Stranger Mountain	17A5	26	31N	38E	4900	Clockum Pass	20B9	25	20N	20E	5370	Stem Glade	21C1	13	15N	8E	5050												
Togo	18A10	6	29N	38E	3370	Cooke Creek	20B10	17	19N	20E	4123	White River	21B13	30	18N	11E	6000												
Sanpoil River																													
Sherman Creek Pass	18A1	19	36N	35E	5350	Domery Flat	21B4M	15	20N	14E	2200	Corral Pass	21B13	30	18N	11E	6000												
Okanogan River																													
Clerk	19A8a	2	36N	23E	7000	Green Lake	21B4M	15	20N	14E	2200	White River Campground	21C34	4	16N	9E													
Muckamuck	19A8a	2	36N	24E	6750	Green Lake	21B4M	15	20N	14E	2200	Airstrip	21B24	18	20N	11E	1800												
Nutton Creek No. 1	19A1	30	37N	24E	5700	Grouse Camp	20B11	29	21N	19E	5385	Charley Creek	21B25	27	21N	8E	1200												
Nutton Creek No. 2	19A2	10	37N	24E	6000	High Creek	20B12	34	20N	19E	2930	Cougar Mountain	21B26	21	20N	8E	4000												
Paydayten	19A2a	32	40N	18E	4300	Joe Lake	21B4M	15	20N	14E	2200	Grass Mountain No. 1	21B27	14	20N	8E	2900												
Rusty Creek	19A2b	18	35N	24E	4000	Lake Cle Elum	21B4M	15	20N	14E	2200	Grass Mountain No. 2	21B28	12	20N	8E	2100												
Salmon Meadows	19A2FM	33	37N	24E	4500	Lemah Creek	21B4M	15	20N	14E	2200	Lester Creek	21B29	36	20N	8E	3100												
Starvation Mtn.	19A10a	15	35N	23E	6750	Manashash	20C1	24	17N	16E	3935	Sawmill Ridge	21B31	5	19N	11E	4700												
Touts Coulee	19A0	30	39N	25E	2845	Morse Lake	21C17	6	16N	11E	5400	Snowshoe Butte	21B43SP	14	20N	11E	5000												
Methow River																													
Billy Goat Pass	20A10a	10	38N	20E	6400	Nimn	20B13	4	20N	19E	3875	Stampede Pass	21B10	25	21N	11E	3000												
Dollar Hatch	20A29a	8	39N	20E	7000	Tunnel Creek	20B14	20	19N	20E	3360	Twin Camp	21B30	18	19N	11E	4100												
Harts Pass	20A5a	17	37N	18E	6500	Tunnel Avenue	21B8	13	21N	11E	2450	City Cabin	21B3	10	21N	10E	2390												
Horseshoe Basin	19A5a	15	40N	23E	7000	Walters Flat	20B15	22	20N	19E	3360	Mt. Gardner	21B21	30	22N	10E	3300												
Loup Loup	19A7	36	34N	23E	4650	White Pass (East Side)	21C28	2	13N	11E	4500	Mt. Gardner Aux.	21B22	31	22N	10E	2500												
Chelan Lake Basin																													
Greenwood Pass	20A22a	12	31N	15E	6500	White Pass (Leach Lake)	21C27	1	13N	11E	4500	Mt. Lindsey	21B16	31	22N	9E	2500												
Cleaveland Flat	20A25a	3	31N	16E	3540																								
Little Meadows	20A24a	8	31N	16E	5275																								
Lynn Lake	20A23a	18	31N	18E	5900																								
Park Creek Flat	21A13a	18	34N	16E	2220																								
Park Creek Ridge	21A12a	7	34N	16E	4600																								
Petersons	20A16a	3	34N	17E	3730																								
Rainy Pass	20A9	21	35N	17E	4780																								
Safety Harbor	21A30A	32	31N	20E	6300																								
War Creek Pass	20A31a	34	33N	18E	6500																								
Enriat River																													
Brief	20B19	34	22N	19E	1600	Asofin Creek	17C4	9	8N	42E	5700	Cedar River	21B3	10	21N	10E	2390												
Enriat Meadows	20A33a	28	31N	17E	4800	Spruce Springs	17C4	9	8N	42E	5700	City Cabin	21B3	10	21N	10E	2390												
Enriat River Trail	20A34a	2	29N	17E	3150	Couse	17C3m	2	9N	35E	3370	Mt. Gardner	21B21	30	22N	10E	3300												
Fox Camp	20A36a	17	30N	18E	6510	Homestead	17C31	11	9N	40E	4030	Mt. Gardner Aux.	21B22	31	22N	10E	2500												
Pope Ridge	20B20	22	29N	18E	4300	Martin Springs (Helmars SW)	17C2M	23	9N	40E	4400	Mt. Lindsey	21B16	31	22N	9E	2500												
Pope Ridge Snow Pillow	20B24SP	22	29N	18E	4300	Walla Walla Diversion	18D13	22	6N	38E	2400	Mt. Washington	21B15	8	22N	9E	3000												
Puth Ridge	21A32a	34	30N	18E	6400	Klickitat River	20D1	21	6N	17E	4030	Hex River	21B17	11	21N	9E	2400												
Puth Ridge	21A37	30	29N	19E	6200	Satus Pass	20D1	21	6N	17E	4030	South Fork Cedar	21B6	24	21N	10E	3000												
Shady Pass	20A35a	21	30N	17E	3850	West Fork Cabin	21C15	23	9N	12E	3000	Tinkhan Creek	21B20	1	21N	10E	3400												
Snow Brushy	20B35a	10	28N	18E	5330	Cultus Creek	21C12	35	7N	8E	4000	Alpine Meadows	21B48	31	27N	9E	3500												
Tommy Creek	20B21a	10	28N	18E	5330	Blue Lake	21C22a	19	9N	8E	4800	Ollalie Meadows	21B2	19	22N	11E	3625												
Wenatchee River																													
Berne-Mill Creek	21B23	7	26N	15E	2925	Bob's Trail	21C21	25	8N	7E	2200	South Fork Tolt	21B18	26	26N	9E	1900												
Berne-Mill Creek (New)	21B41SP	13	26N	14E	3240	Calamity Ridge	22D1a	8	5N	5E	2500	Lake Elizabeth	21B19	33	26N	10E	2900												
Blavett Pass No. 2	20B2	35	22N	17E	4270	Council Pass	21C18a	24	9N	9E	4200																		
Chitaukum G. S.	20B16	4	25N	17E	1810																								
Leavenworth R. S.	20B17	33	27N	17E	1970																								
Merritt	20B18	4	26N	16E	2140																								
Stevens Pass	21B1	14	26N	13E	4070																								
Stevens Pass Sand Shed	21B45	12	26N	19E	3700																								
Trough #2	20B25SP	10	20N	20E	5310																								



# WATER SUPPLY OUTLOOK

State of Washington

May 1, 1970

\* \* \* \* \*  
\* There has been a general improvement in the water supply outlook \*  
\* for the remainder of the irrigation and runoff season 1970. This \*  
\* improvement has come about not so much by the increased input in \*  
\* to the watersheds but more from the lack of runoff during the \*  
\* month of April. Although there has been a general increase in the \*  
\* precipitation measured at valley stations as reported by the U.S. \*  
\* Weather Bureau the improvement in the snow cover at the higher \*  
\* elevations is much more marked. Precipitation through March was \*  
\* above normal only in the southeastern portion of the State. So far \*  
\* during the month of April above-normal precipitation occurred in \*  
\* the northeastern portion of the State, the central, as well as on \*  
\* the west slopes of the Cascades. None of the streams flowing from \*  
\* Washington mountains or tributary basins to Washington had normal \*  
\* flows. April flows range from a low of 33% of normal to a high of \*  
\* 88%. Reservoirs generally have much less amounts of water in stor- \*  
\* age as of May 1 mainly because of the lack of river flows or in- \*  
\* flows in to the reservoirs. This is primarily true for the pow- \*  
\* er reservoirs since the water is needed on a daily basis now for \*  
\* hydroelectric generation. \*  
\* \* \* \* \*

## SNOW COVER

The snowpack throughout the State is now generally well above average except for a few of the drainages on the west side and in the Columbia Gorge. The highest, percentagewise, is the Pend Oreille River with a snowpack 160% greater than normal. The lowest is in the Olympic Peninsula, the Elwha River, with a snow cover that is only 64% of average. The Chelan, White Salmon, Lewis, Green, Skagit, and Baker, all have below normal snowpacks as of May 1. Comparison of snow covers at this time is misleading because the low elevations normally are bare as of May 1 and the mid-elevation snow courses vary widely from year to year. Only those snow courses above 3500 feet can be considered an indication of snow cover.

## RESERVOIRS

Of the list of reservoirs published in this report only two have water in storage greater than normal as of May 1. Conconully reservoir in the Okanogan River drainage has slightly more water in storage than normal or than has occurred during the last two years. Its companion lake, Salmon, has less water in storage than normal for the combined total of less water in storage than normal for this time of year. Diablo reservoir in the Skagit drainage, a diversion-type impoundment, has slightly more than normal. The other key power reservoirs, such as F. D. Roosevelt Lake and Lake Chelan, have only approximately 25% of normal stored water. The irrigation reservoirs in the Yakima watershed have 77% normal amounts of stored water.



## PRECIPITATION

In the Columbia Basin in Canada precipitation was only 75% of normal. This lack of precipitation extended across the Canadian provinces and reduced to 55% of normal in the central or Okanogan-Similkameen area. In the Kettle-Colville-Sanpoil area precipitation was also 75% of normal but to the south, in the Pend Oreille-Spokane drainage precipitation was 17% above normal. In the southeastern portion of the State, where above-normal precipitation has occurred since November, rainfall was only 76% of normal in April. On the west side on the northwest slopes, precipitation was 56% above normal; on the southwest slopes precipitation was 22% above.

## SOIL MOISTURE

In the central portion of the State the soil moisture condition is similar to that which has been experienced the last two years. In the Okanogan area it was the same as last year but less than two years ago. In the Yakima drainage comparison cannot be made to last year but the situation is improved over 1968. Similar soil moisture conditions occurred in the Walla Walla drainage area to those experienced in the last two years.

## STREAMFLOW

During the month of April streams had less than normal flows ranging from 88% of normal for the Chehalis to 33% for the Similkameen. Streams in the eastern portion of the State generally have lower flows than those along the west side and in the Blue Mountains. Forecasts for the remainder of the runoff season have been increased from those published last month, as much as 20%, but generally, flows will be normal or below but should be adequate for most users. The timing of the runoff will be all-important to both the irrigation users and the hydroelectric power manufacturers.





# STREAMFLOW FORECAST - MAY 1970

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts. Streamflow figures for 1969 are preliminary and subject to revision.

Basin, Stream and Station	Forecast Runoff 1970	% 15-Yr Avg.	Fore- cast Period	Seasonal Streamflow in Thousands of Acre-Feet			
				1969	1968	1967	15-Yr Average 1953-67
<u>COLUMBIA BASIN</u>							
<u>Columbia River System</u>							
<u>Columbia River</u>							
at Birchbank <u>1/</u>	36500	84	May-Sep	44842	45987	52160	43577
	27700	80	May-Jul	35647	35293	41123	34692
	19500	80	May-Jun	27310	23482	28758	24252
<u>Columbia River</u>							
at Grand Coulee <u>1/</u>	54000	86	May-Sep	62362	59748	69513	62799
	45200	86	May-Jul	53372	47649	59056	52240
	32200	82	May-Jun	42279	34147	44471	39230
<u>Columbia River</u>							
bl Rock Island Dam <u>1/</u>	58580	85	May-Sep	67499	65842	78052	68964
	47280	82	May-Jul	58282	52947	66635	57500
	35380	82	May-Jun	46531	37870	50064	43110
<u>Columbia River</u>							
at The Dalles, OR <u>1/</u>	82350	89	May-Sep	87847	81386	101387	92456
	67350	87	May-Jul	75516	64872	86619	77330
	51950	87	May-Jun	61607	47877	66390	59690
<u>Pend Oreille River System</u>							
<u>Pend Oreille River</u>							
bl Box Canyon	13300	96	May-Sep		11500	15193	13863
	12000	95	May-Jul		9708	14288	12644
	9900	93	May-Jun		8102	12063	10619
<u>Kettle River System</u>							
<u>Kettle River</u>							
nr. Laurier	1550	93	May-Sep	1717	1696	1753	1667
	1480	94	May-Jul	1667	1565	1720	1571
	1320	95	May-Jun	1524	1405	1580	1393
<u>Colville River</u>							
at Kettle Falls	100	102	May-Sep		42	86	98
	88	102	May-Jul		33	80	86
	77	101	May-Jun		29	73	76

1/ Observed flow corrected for storage in any of the following reservoirs which are above the station: Kootenay Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee, Noxon Reservoir and pumpage at F. D. Roosevelt Lake.





# Streamflow Forecasts - May 1970 (Cont.)

Basin, Stream and Station	Forecast Runoff 1970	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast Period	1969	1968	1967	15-Yr Avg 1953-67
<u>Spokane River System *</u>							
Spokane River							
at Post Falls ID <u>2/</u>	2100	100	May-Sep		1228	2226	2110
	2000	100	May-Jul		1080	2166	2015
	1870	100	May-Jun		985	2033	1872
<u>Okanogan River System**</u>							
Similkameen River							
nr. Nighthawk	1140	80	May-Sep	1089	1377	1641	1431
	1070	81	May-Jul	1040	1287	1571	1325
	920	83	May-Jun	940	1086	1360	1103
Okanogan River							
nr. Tonasket	1400	87	May-Sep		1486	1736	1609
	1280	88	May-Jul		1348	1654	1449
	1060	89	May-Jun		1122	1426	1190
<u>Methow River System**</u>							
Methow River							
nr. Pateros	880	91	May-Sep		900	1217	969
	825	92	May-Jul		833	1159	895
	700	93	May-Jun		694	995	748
<u>Chelan River System</u>							
Chelan River							
at Chelan <u>3/</u>	990	86	May-Sep		1149	1310	1148
	880	88	May-Jul		993	1175	1001
	675	90	May-Jun		722	910	752
Stehekin River							
at Stehekin	680	82	May-Sep		815	970	827
	585	84	May-Jul		682	834	695
	445	87	May-Jun		482	639	509
<u>Wenatchee River System</u>							
Wenatchee River							
at Plain	1090	92	May-Sep		1050	1253	1183
	985	93	May-Jul		914	1142	1053
	790	98	May-Jun		698	884	802
Wenatchee River							
at Peshastin	1480	92	May-Sep		1381	1703	1606
	1360	94	May-Jul		1210	1567	1444
	1090	98	May-Jun		915	1232	1108

\* Forecasts made by Morlan W. Nelson and J. Alden Wilson, Soil Conservation Service, Boise, Idaho.

\*\* These forecasts are based in part upon base flow data especially prepared and furnished for this purpose by the U. S. Geological Survey.

2/ Observed flow corrected for storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie Canals.

3/ Observed flow corrected for storage in Lake Chelan.



## Streamflow Forecasts - May 1970 (Cont.)

Basin, Stream and Station	Forecast Runoff 1970	Seasonal Streamflow in Thousands of Acre-Feet					
		%	Fore-				15-Yr.
		15-Yr. Avg.	cast Period	1969	1968	1967	Avg. 1953-67
<u>Wenatchee River System (Cont.)</u>							
<u>Stemilt Basin</u>							
nr. Wenatchee	130	--	May-Sep			146*	--
<u>Yakima River System</u>							
<u>Yakima River</u>							
nr. Martin <u>4/</u>	95	81	May-Sep		80	105	118
	88	82	May-Jul		62	102	107
	74	84	May-Jun		56	91	88
<u>Yakima River</u>							
at Cle Elum <u>5/</u>	650	82	May-Sep		592	792	790
	595	84	May-Jul		486	726	707
	500	86	May-Jun		403	619	584
<u>Yakima River</u>							
nr. Parker <u>6/</u>	1175	90	May-Sep			1382	1308
	1175	91	May-Jul			1422	1292
	1105	96	May-Jun			1318	1153
<u>Kachess River</u>							
nr. Easton <u>7/</u>	84	82	May-Sep		62	91	102
	78	82	May-Jul		52	89	95
	70	86	May-Jun		48	80	81
<u>Cle Elum River</u>							
nr. Roslyn <u>8/</u>	345	83	May-Sep		321	406	415
	315	84	May-Jul		274	380	375
	265	87	May-Jun		227	322	303
<u>Bumping River</u>							
nr. Nile <u>9/</u>	125	94	May-Sep		94	138	133
	115	95	May-Jul		82	130	121
	97	100	May-Jun		62	108	97
<u>American River</u>							
nr. Nile	103	92	May-Sep		88	120	112
	95	92	May-Jul		78	112	103
	80	96	May-Jun		67	92	83
<u>Tieton River</u>							
at Tieton Dam <u>10/</u>	205	95	May-Sep		149	225	216
	175	96	May-Jul		116	195	181
	135	98	May-Jun		93	154	138

\* Thousands of Miners' Inches.

4/ Observed flow corrected for storage in Lake Keechelus.5/ Observed flow corrected for storage in Keechelus, Kachess and Cle Elum Lakes and diversion by Kittitas Canal.6/ Observed flow corrected for storage in Keechelus, Kachess, Cle Elum, Bumping and Rimrock Lakes and diversions by Roza, Union Gap, New Reservation, Old Reservation and Sunnyside Canals.7/ Observed flow corrected for storage in Lake Kachess8/ Observed flow corrected for storage in Lake Cle Elum.9/ Observed flow corrected for storage in Bumping Lake.10/ Observed flow corrected for storage in Rimrock Lake.





# Streamflow Forecasts - May 1970 (Cont.)

Basin, Stream and Station	Forecast Runoff 1970	%	Fore- cast Period	Seasonal Streamflow in Thousands of Acre-Feet			
				15-Yr. Avg.	1969	1968	1967

## Yakima River System (Cont.)

Naches River							
nr. Naches <u>11/</u>	685	92	May-Sep		512	809	748
	615	92	May-Jul		430	743	668
	525	96	May-Jun		357	628	547

Ahtanum Creeks							
nr. Tampico <u>12/</u>	40	100	May-Sep		26	51	40
	34	98	May-Jul		22	47	35
	29	98	May-Jun		19	40	30

## Lower Columbia River System

Mill Creek							
nr. Walla Walla	23	128	May-Sep		10	16	18
	19	136	May-Jul		7	13	14
	16	133	May-Jun		5	12	12

Lewis River							
at Ariel <u>13/</u>	870	91	May-Sep		784	856	956
	725	91	May-Jul		509	743	796
	610	93	May-Jun		429	638	657

Cowlitz River							
at Castle Rock <u>14/</u>	1860	88	May-Sep		1896	2115	2120
	1570	88	May-Jul		1365	1853	1789
	1280	90	May-Jun		1144	1528	1426

## OLYMPIC PENINSULA

### Dungeness River System

Dungeness River							
nr. Sequim	125	82	May-Sep		121	191	153
	102	84	May-Jul		93	156	122
	74	86	May-Jun		65	111	86

- 
- 11/ Observed flow corrected for storage in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox Canals and City of Yakima.
- 12/ Observed flow of North and South Forks (combined).
- 13/ Observed flow corrected for storage in Lake Merwin, Yale and Swift Reservoirs
- 14/ Observed flow corrected for storage in Mayfield Reservoir.





# COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about May 1, 1970, as per cent of the same date in 1969 and 1968 and average of record.

Tributary Basin	No. of Courses Average	Years of Record	1970 Snow Water Expressed as per cent of		
			1969	1968	1953-67
<u>UPPER COLUMBIA BASIN</u>					
Pend Oreille	11 - 14	6 - 33	113	130	260*
Kettle	7 - 10	7 - 32	114	157	121*
Spokane	3 - 4	6 - 33	137	199	121*
Okanogan	13 - 15	5 - 35	136	140	118*
Methow	1 - 4	9 - 28	111	76	125*
Chelan	1 - 2	9 - 38	74	78	83*
Entiat	8	3 - 5	88	--	--
Wenatchee	1 - 6	9 - 38	93	180	104*
Yakima	5 - 10	4 - 50	116	209	140*
<u>LOWER COLUMBIA</u>					
White Salmon	2	26	76	141	90*
Lewis	10 - 14	9 - 26	62	155	73*
Cowlitz	1	7 - 30	101	183	128*
<u>PUGET SOUND</u>					
White	1	14 - 30	96	133	102*
Green	2	9 - 24	83	166	99*
Snoqualmie	1	2 - 24	96	217	106*
Skykomish	1 - 2	12 - 24	92	180	104*
Skagit	6 - 8	19 - 38	104	127	96*
Baker	6 - 7	12	71	87	67*
<u>OLYMPIC PENINSULA</u>					
Elwha	1	20	51	86	64*
Dungeness	1	20	73	104	82*

\* Records of less than 15 years used on computation of average.



RESERVOIR STORAGE - 1000 Acre Feet

BASIN or STREAM	RESERVOIR	USABLE 1/ CAPACITY	Measured (May)			Normal*
			1970	1969	1968	
<u>COLUMBIA</u>						
Spokane	Coeur d'Alene Lake	225.1	149.5	441.8	127.0	299.9
Columbia	Franklin D. Roosevelt Lake	5232.0	538.5	-1864.1	- 284.2	2444.9
Columbia	Banks Lake	761.8	648.0	581.3	464.3	409.7
Okanogan	Conconully Reservoir	13.0	8.1	6.6	7.4	7.6
Okanogan	Salmon Lake	10.5	7.6	7.6	9.0	8.7
Chelan	Lake Chelan	676.1	74.3	229.1	449.6	210.0
<u>YAKIMA</u>						
Yakima	Keechelus Lake	157.8	99.3	107.9	141.4	120.6
Kachess	Kachess Lake	239.0	196.2	193.0	215.9	202.4
Cle Elum	Lake Cle Elum	436.9	216.9	323.4	385.3	323.2
Bumping	Bumping Lake	33.7	7.7	7.7	15.7	20.1
Tieton	Rimrock Lake	198.0	119.5	165.6	165.0	154.1
<u>PUGET SOUND</u>						
Skagit	Ross Reservoir	1202.9	541.0	546.5	993.0	695.4
Skagit	Diablo Reservoir	90.6	86.4	87.0	88.3	85.2
Skagit	Gorge Reservoir	9.8	8.0	8.0	8.8	--

1/ Based on Active Storage

\* 15-year average 1953-67





SOIL MOISTURE - MAY

Drainage Basin and Station	Number	Elev.	Profile Depth	(Inches) :		Soil Moisture Content	
				Total Capacity	:	(Inches) as of May 1	
						1970	1969 1968
<u>CRAB CREEK</u>							
Jack Woods	18B3m	2600	48	13.6	10.4	10.3	9.6
Krause	18B4m	2440	48	13.6	9.2	9.4	8.7
Sheffels	18B5m	2360	48	13.6	8.7	8.3	7.3
Sherman	18B7m	2440	48	13.6	8.9	8.6	8.6
Wheatridge	18B6m	2200	48	13.6	9.6	9.5	8.6
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	3.7	3.7	4.2
Trout Creek	3-M	3600	48	7.3	Destroyed	5.3	6.3
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	5.6	--	4.9
Lake Cle Elum	21B14M	2200	48	12.8	9.2	--	9.2
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	10.4	10.9	7.2
Helmerts	17C2M	4400	48	12.0	10.5	11.2	11.3
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	6.3	6.5	10.9

FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile Depth	(Inches) :		Soil Moisture Content	
				Total Capacity	:	(Inches) as of Oct 1	
						1969	1968 1967
<u>CRAB CREEK</u>							
Jack Woods	18B3m	2600	48	13.6	7.5	7.1	5.2
Krause	18B4m	2440	48	13.6	5.9	5.2	4.9
Sheffels	18B5m	2360	48	13.6	4.5	4.9	3.7
Sherman	18B7m	2440	48	13.6	4.2	3.9	3.6
Wheatridge	18B6m	2200	48	13.6	5.4	4.6	4.0
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	2.7	2.7	1.5
Trout Creek	3-M	3600	48	7.3	3.8*	4.1	4.0
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	Not available	3.1	4.8
Lake Cle Elum	21B14M	2200	48	12.8	Not available	5.2	9.1
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	6.1	7.4	5.4
Helmerts	17C2M	4400	48	12.0	7.1	7.6	6.7
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	9.8	5.5	5.6

\* Nov 1 measurement



# PRECIPITATION 1/

## Division Averages and Departures

DRAINAGE DIVISIONS	FALL Sept-Oct 1969 <u>2/</u>		WINTER Nov. '69 - Mar. '70 <u>2/</u>		SPRING April '70 <u>2/</u>	
	Observed - Departure		Observed - Departure		Observed - Departure	
Columbia in Canada	4.73	+0.84	8.94	-3.75	1.03	-0.35
Pend Oreille - Spokane	3.81	-0.07	16.52	-1.73	2.72	+0.39
Northeastern Washington	2.91	+0.66	10.07	-1.02	1.07	-0.36
Southeastern Washington	2.56	-0.09	14.26	+1.85	1.44	-0.44
Central Washington	3.83	-0.61	22.65	-4.48	2.64	+0.43
North Central Washington	2.02	+0.61	5.86	-0.48	0.43	-0.34
Northwest Slope Cascades	12.20	+0.53	38.97	-13.17	9.22	+3.31
Southwest Slope Cascades	9.55	+1.83	36.37	-4.50	5.29	+0.96

Northeastern Washington	- Lower Spokane, Colville, Sanpoil and lower Kettle drainages.
Southeastern Washington	- Touchet, Tucannon and Palouse drainages.
Central Washington	- Yakima, Wenatchee and Chelan drainages.
North Central Washington	- Methow and Okanogan drainages.
Northwest Slope Cascades	- Puget Sound drainages.
Southwest Slope Cascades	- Lower Columbia drainages.

1/ - Preliminary analysis by U. S. Weather Bureau from data furnished by Meteorological Services of Canada and U. S. Weather Bureau

2/ - Departure from 15-year (1953-67) drainage division average.

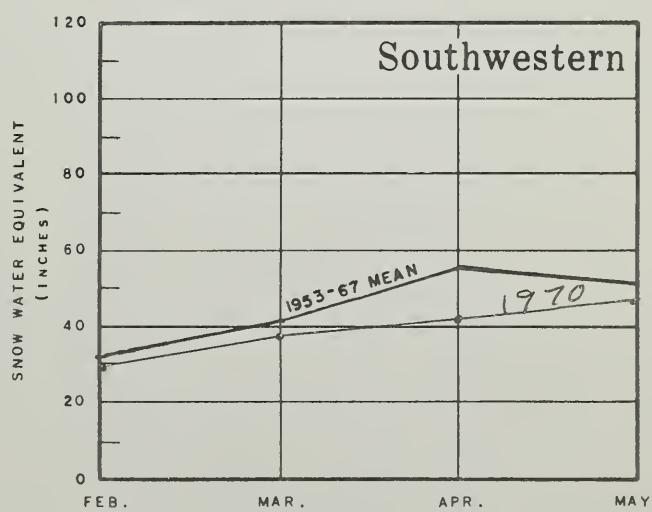
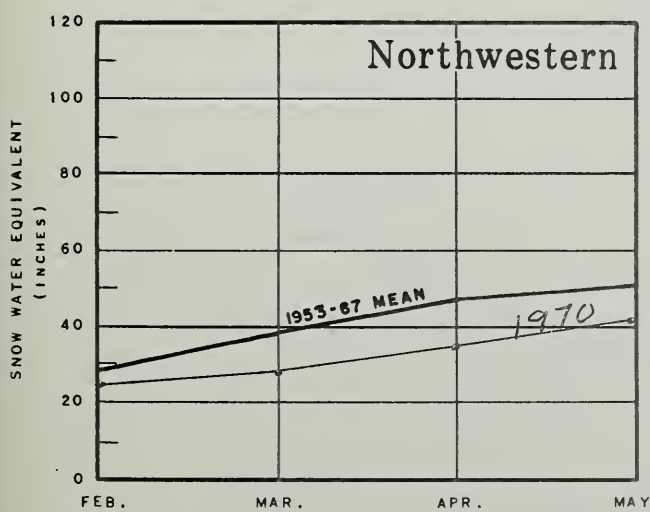
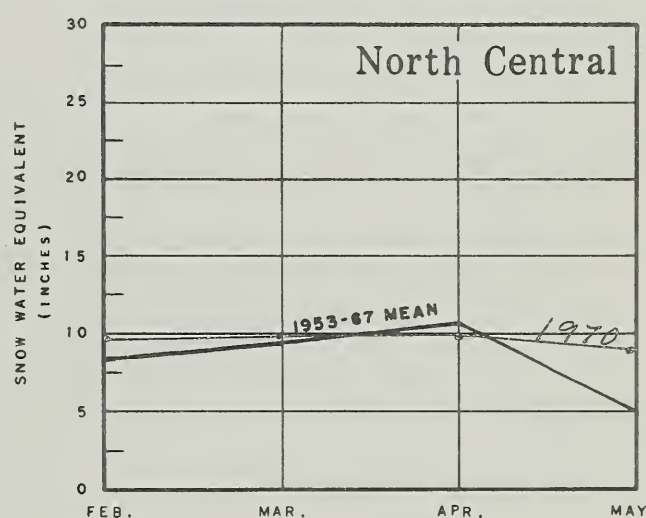
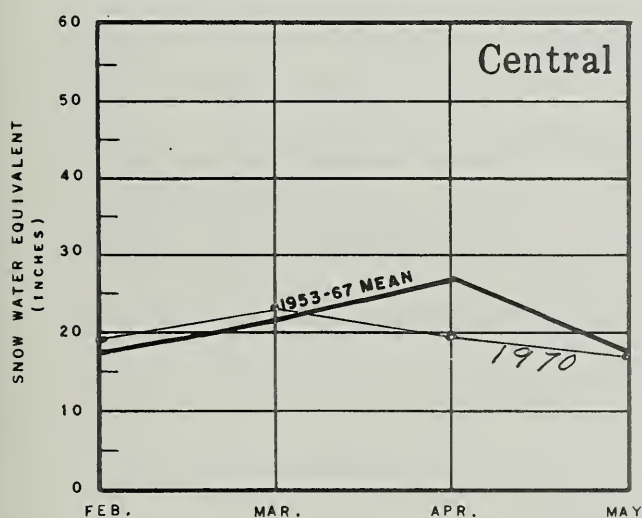
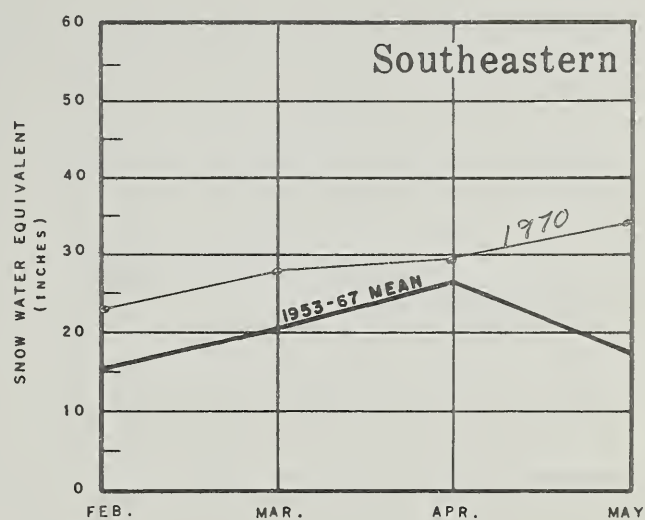
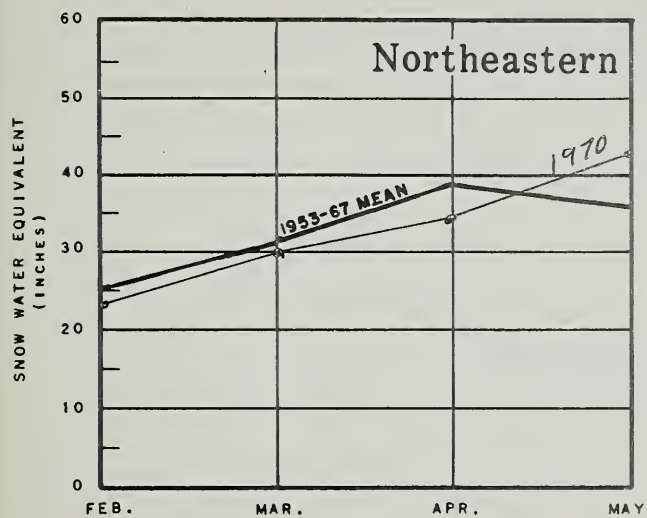




# WASHINGTON SNOW COVER

1970

## DRAINAGE AREAS

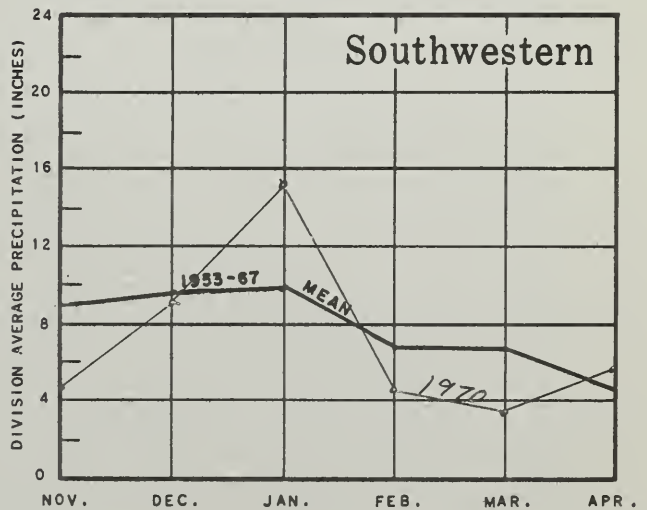
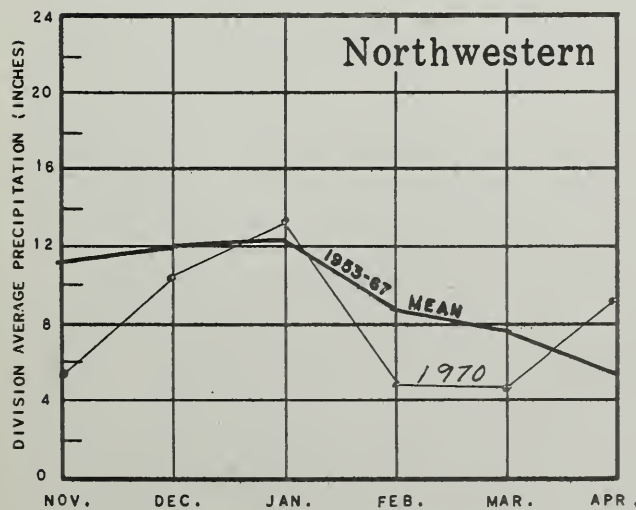
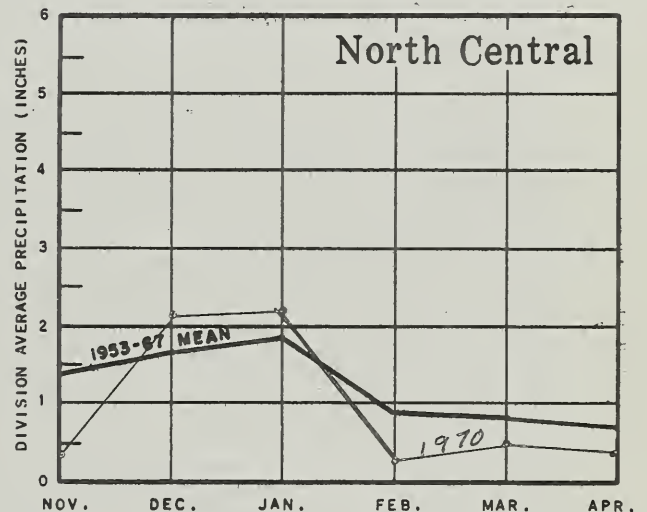
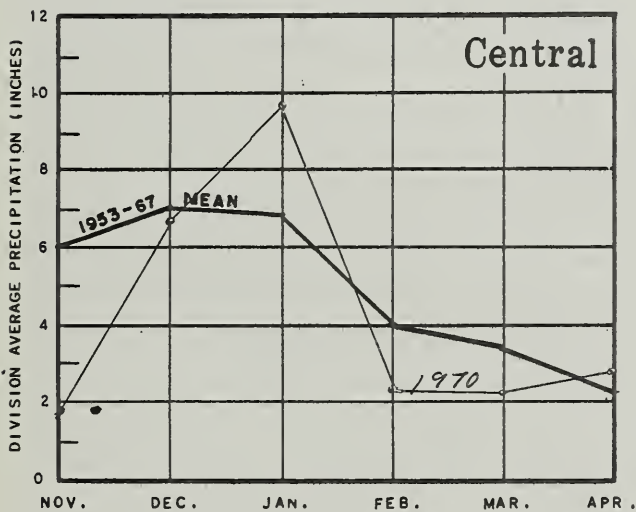
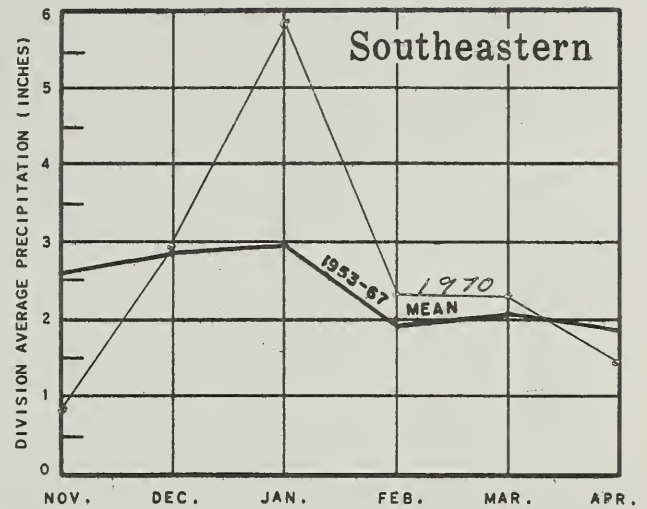
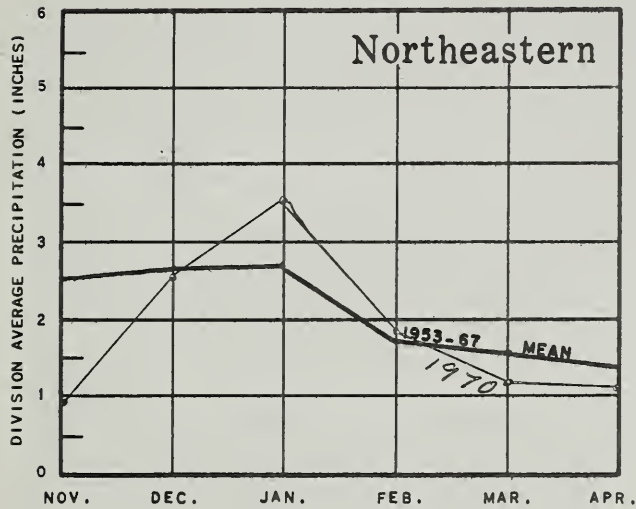




# WASHINGTON VALLEY PRECIPITATION

1969-1970

## DRAINAGE AREAS



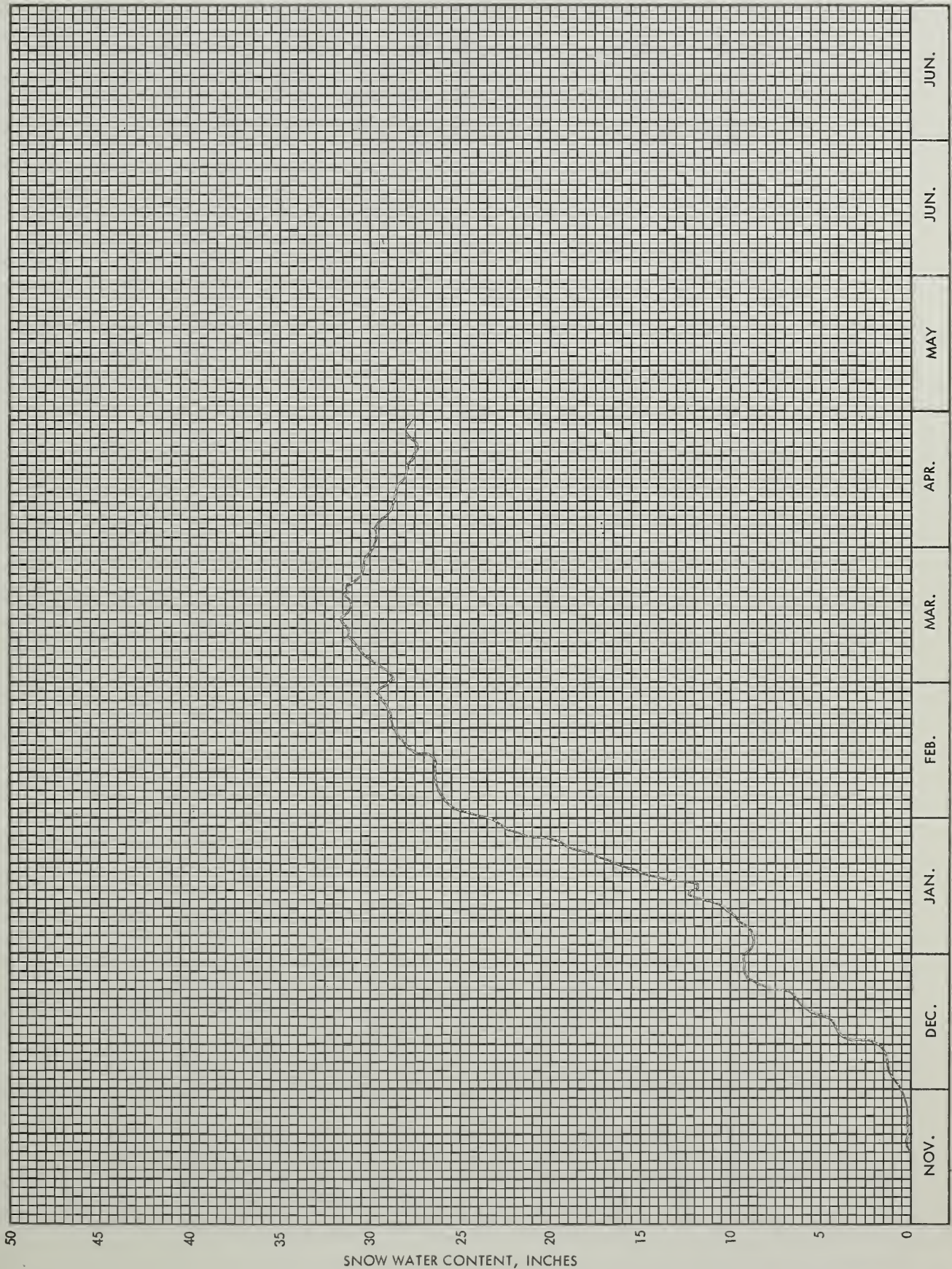




1969 - 70  
SNOW PILLOW DATA

Berne-Mill Creek

Sec. 13 T. 26N R. 14E No. 21B41SP Drainage: Wenatchee  
Lat. 47° 46' Long. 121° 01' Elev. 3170'

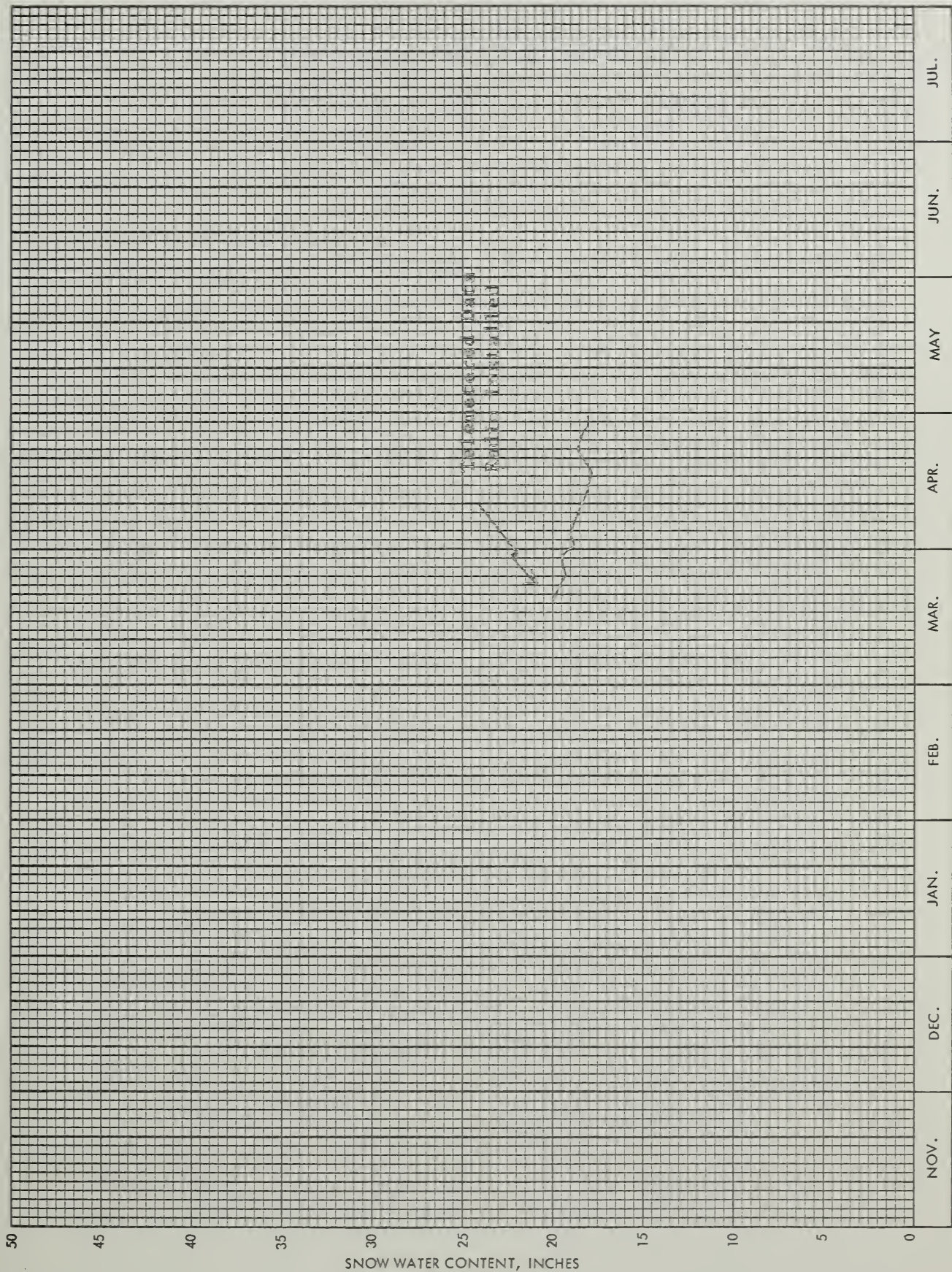






1969 - 70  
SNOW PILLOW DATA  
TROUGH # 2

Sec. 10 T. 20N R. 20E No. 20B25SF Drainage: Colockum Creek  
Lat. 47° 14' Long. 120° 19' Elev. 5310'

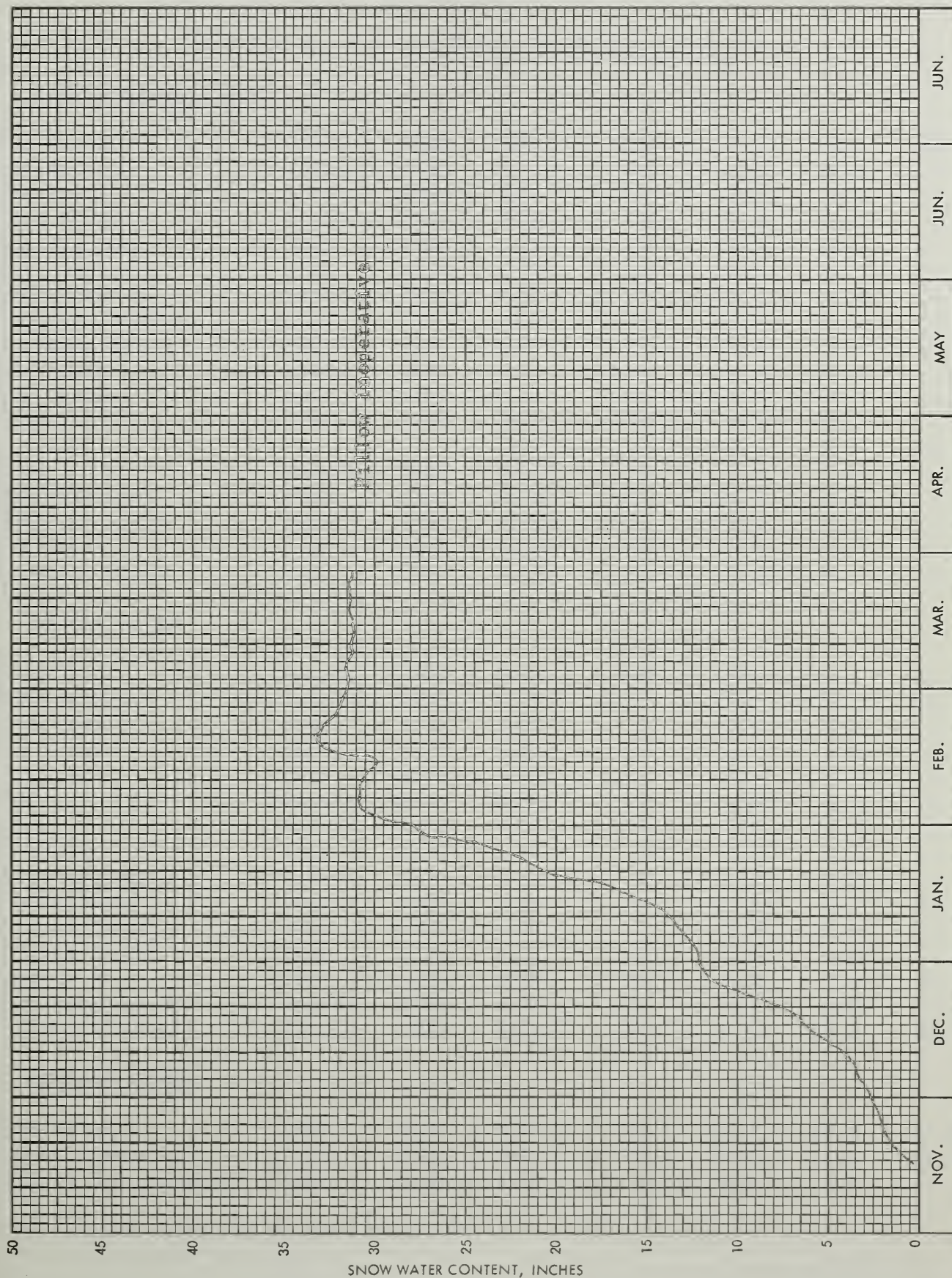






1969 - 70  
SNOW PILLOW DATA  
Snowshoe Butte - FS

Sec. 28 T. 21N R. 9E No. 21B43SF Drainage: Green River  
Lat. 47° 13' Long. 121° 22' Elev. 5000'







APPENDIX 1  
SNOW DATA APRIL 1 to MAY 1, 1970

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average <sup>††</sup>

U P P E R C O L U M B I A D R A I N A G E

PEND OREILLE RIVER

Baree Creek	15B11	5500	5/1	115	49.2	40.2	48.4
Baree Midway	15B16	4600	5/1	99	41.1	32.9	--
Baree Trail	15B15	3800	5/1	21	8.7	0.0	1.0*
Benton Meadow	16A2	2344	4/29	0	0.0	0.0	0.0
Benton Spring	16A3	4900	4/29	53	20.6	16.2	17.1
Boyer Mountain	17A2	5250	4/28	69	26.8	26.8	25.2
Brush Creek	14A4	5000	5/4	33	13.2	16.6	10.8
Bunchgrass Meadow	17A1	5000	4/28	70	28.5	32.1	30.4
Heart Lake Trail	14C10	4800	5/1	62	24.3	15.0	17.2
Hoodo Basin	15C10	6000	5/1	138	56.5	51.2	--
Hoodo Creek	15C1	6200	5/1	132	53.2	49.2	52.0*
Lookout	15B2	5250	4/15	99	39.9	42.9	--
			4/30	111	42.4	37.4	36.7
Nelson	Canada	3050	4/29	19	8.0	5.8	6.0**
Schweitzer Bowl	16A6	4500	4/30	71	29.3	25.2	--
Schweitzer Ridge	16A5	6100	4/30	112	43.3	67.0	--
Smith Creek	16A1	4800	4/28	95	37.9	46.7	49.4
Winchester Creek	17A3	2970	4/28	13	5.0	4.1	0.5

KETTLE RIVER

Barnes Creek	Canada	5500	4/29	49	17.4	17.1	21.2**
Big White Mtn.	Canada	5500	4/30	51	17.8	20.1	20.9**
Boulder Road	18A2	1450	4/26	0	0.0	0.0	--
Butte Creek	18A3	4070	4/26	26	8.0	6.0	5.5*
Cabin Creek	18A8	3170	4/26	11	3.5	3.0	--
Carmi	Canada	4100	4/30	8	2.8	2.0	1.1**
Farron	Canada	4000	4/30	23	9.7	12.5	9.6**
Goat Creek	18A4	3595	4/26	0	0.0	0.0	--
Lower Trapping Cr.	Canada	3050	4/30	0	0.0	0.0	--
#Monashee Pass	Canada	4500	4/29	31	10.3	8.7	13.7**
Snow Caps Creek	18A5	2150	4/26	0	0.0	0.0	--
Snow Caps Trail	18A6	2720	4/26	0	0.0	0.0	--
Summit G. S.	18A7	4600	4/26	26	8.4	7.4	6.3*
Upper Trapping Cr.	Canada	5500	4/30	21	6.7	3.8	--
Old Glory Mountain	Canada	7000	4/25	70	27.6	39.8	29.7

SPOKANE RIVER

Copper Ridge	16B2	4800	4/30	75	31.2	29.8	27.8
Forty-nine Meadows	15B3	5000	5/4	79	34.2	20.8	31.4*
Fourth of July Summit	16B3	3100	4/30	0	0.0	0.0	--

# Not located directly on this drainage

\* Adjusted 1953-67 average

\*\* Average for years of record

†† 1953-67 average





## APPENDIX 2

SNOW			THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average + +

SPOKANE RIVER (Cont.)

Granite Peak	15B13A	6000	5/4	113	47.4	46.1	--
#Lookout	15B2	5250	4/15	99	39.9	42.9	--
			4/30	111	42.4	37.4	36.7
Lost Lake	15B14A	6000	5/4	135	58.0	73.0	--
Lower Sands Creek	16B1	3400	4/30	47	19.9	18.7	14.6
Medicine Ridge	15B4A	6150	5/4	116	45.8	45.5	--
Outlaw Creek	15B12A	3750	Not Measured			0.0	--
Sherwin	16C1	3200	4/27	25	9.4	4.2	--

OKANOGAN RIVER

Aberdeen Lake	Canada	4300	5/1	11	3.7	0.0	--
Blackwall Mountain	Canada	6250	5/1	84	32.0	34.7	36.6**
Bouleau Creek	Canada	5000	4/30	28	9.9	9.1	6.7**
Brenda Mine	Canada	4800	4/28	25	8.6	7.9	--
Brookmere	Canada	3200	4/26	21	6.4	3.5	5.6
Carrs Landing #1	Canada	2250	4/23	0	0.0	0.0	--
Carrs Landing #2	Canada	3200	4/23	0	0.0	0.0	--
Clark +	19A8a	7000	Not Measured			--	--
Enderby	Canada	6250	5/1	97	30.9	42.6	41.9**
#Freezeout Meadows	20A2	5000	4/28	81	29.4	26.0	31.6
Hamilton Hill	Canada	4900	5/1	39	14.4	10.2	11.1**
#Harts Pass	20A5A	6500	4/29	104	41.7	49.0	49.8
Isontok Lake	Canada	5510	5/2	20	5.6	5.0	6.0**
Lost Horse Mountain	Canada	6300	5/1	34	10.0	9.8	9.6**
McCulloch	Canada	4200	4/28	14	4.6	1.1	2.8
Missezula Mountain	Canada	5100	Not Measured			0.0	5.0**
Mission Creek	Canada	6000	4/27	56	18.2	21.1	21.5
Monashee Pass	Canada	4500	4/29	31	10.3	8.7	13.3**
Mount Kobau	Canada	5950	4/29	39	12.7	14.4	--
Mutton Creek No. 1	19A1	5700	4/29	34	13.9	11.2	10.0
Mutton Creek No. 2	19A4	6000	4/29	44	15.4	15.0	15.1
Nickel Plate Mountain	Canada	6200	5/1	30	7.8	7.9	8.3**
Postill Lake	Canada	4500	4/29	24	7.9	5.9	6.6**
Rusty Creek	19A3	4000	4/29	0	0.0	0.0	1.3*
Salmon Meadows	19A2	4500	4/29	21	8.8	6.7	5.0
Silver Star Mountain	Canada	6050	4/29	63	24.5	33.9	27.3**
Summerland Reservoir	Canada	4200	5/2	15	5.3	4.3	--
Trout Creek	Canada	4700	4/27	21	6.2	3.4	4.2

# Not located directly on this drainage

\* Adjusted 1953-67 average

\*\* Average for years of record

++ 1953-67 period



## APPENDIX 3

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average ††

METHOW RIVER

Harts Pass	20A5A	6500	4/29	104	41.7	49.0	49.8
#Mutton Creek No. 1	19A1	5700	4/29	34	13.9	11.2	10.0
#Mutton Creek No. 2	19A4	6000	4/29	44	15.4	15.0	15.1
#Rusty Creek	19A3	4000	4/29	0	0.0	0.0	1.3*
#Salmon Meadows	19A2	4500	4/29	21	8.8	6.7	5.0

CHELAN LAKE BASIN

Rainy Pass	20A9	4780	4/29	89	36.4	42.6	43.9
Safety Harbor	20A30A	6300	4/28	78	22.9	35.9	--

ENTIAT RIVER

Brief	20B19	1600	4/25	0	0.0	0.0	0.0*
Entiat Meadows +	20A33a	4800	4/30	72	26.6	38.5	--
Entiat River Trail +	20A34a	3150	4/30	18	7.4	8.8	--
Fox Camp +	20A36a	6510	4/30	128	47.4	63.5	--
Pope Ridge	20B20	4300	4/14	27	11.0	18.6	--
			4/28	23	9.4	8.0	--
Pugh Ridge +	20A32a	6400	4/30	81	30.0	40.0	--
Shady Pass	20A37	5000	4/15	56	21.2	34.9	--
			4/29	62	22.8	33.0	--
Snow Brushy +	20A35a	3850	4/30	61	22.6	25.9	--
Tommy Creek	20B21a	5300	4/30	70	25.9	20.7	--

WENATCHEE RIVER

Berne-Mill Creek	21B23	2925	4/29	55	25.5	25.3	18.2*
Berne-Mill Creek New	21B41SP	3240	4/29	54	23.0	23.6	--
Blewett Pass No. 2	20B2	4270	4/15	37	17.5	18.7	12.1*
			5/1	35	17.1	12.9	8.9
Chiwaukum G. S.	20B16	1810	4/29	0	0.0	2.2	--
#Fish Lake	21B4	3371	4/27	61	27.4	30.9	24. *
Lake Wenatchee	20B5	1970	4/29	0	0.0	0.0	--
Leavenworth R. S.	20B17	1127	4/30	0	0.0	0.0	--
Merritt	20B18	2140	4/29	11	3.8	4.4	--
Stevens Pass	21B1	4070	4/15	112	50.1	65.0	55.7*
			4/29	123	55.5	62.4	53.5
Stevens Pass Sand Shed	21B45	3700	4/15	78	32.6	40.5	--
			4/28	83	36.0	38.4	--

# Not located directly on this drainage

†† 1953-67 period

\* Adjusted 1953-67 average

+ Snow water equivalent estimated from aerial stadia observation



## APPENDIX 4

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average $\frac{++}{+}$

SQUILCHUCK CREEK

Beehive Springs	20B3	4400	4/29	15	6.7	3.5	--
Scout-A-Vista	20B4	3400	4/29	0	0.0	0.0	--

STEMILT CREEK

Jump-Off	20B8	4450	4/28	16	7.8	4.2	--
Stemilt Slide	20B6	5000	4/27	26	12.4	8.4	4.0*
Upper Wheeler	20B7	4400	4/27	10	4.4	0.0	--

COLOCKUM CREEK

Colockum Creek Upper	20B22	5300	4/28	37	17.5	13.7	--
Colockum Creek Lower	20B23	4300	4/28	19	8.2	0.0	--

YAKIMA RIVER

#Ahtanum R. S.	21C11	3100	Not Measured			0.0	0.0*
Big Boulder Creek	21B9	3200	4/27	38	14.6	11.7	5.0*
#Blewett Pass No. 2	20B2	4270	4/15	37	17.5	18.7	12.1*
			5/1	35	17.1	12.9	8.9
Bumping Lake	21C8	3450	Not Measured			--	13.3*
			4/29	41	19.2	9.1	9.3
Bumping Lake New	21C36	3400	4/29	44	19.6		--
Fish Lake	21B4	3371	4/27	61	27.4	30.9	24.1*
Joe Lake	21B46a	4624	Not Measured				
Lemah Creek +	21B47a	3327	4/30	81	35.6	28.2	--
Morse Lake	21C17	5400	4/28	150	63.8	66.3	62.4*
#Olallie Meadows	21B2	3625	4/15	96	44.1	50.0	51.0*
			5/1	106	51.0	52.9	48.1*
#Satus Pass	20D1	4030	4/30	0	0.0	2.5	--
#Stampede Pass	21B10	3000	4/15	102	36.6	50.3	--
			4/30	109	45.5	56.3	46.0
Tunnel Avenue	21B8	2450	Not Measured			--	21.5*
			4/30	37	17.2	20.4	17.4
Waptus Lake	21B49a	3024	4/30	78	34.3	New Marker	
White Pass (E. Side)	21C28	4500	Not Measured			--	27.8*
			5/1	64	29.1	29.0	26.2*
White Pass (L. Lake)	21C27	4500	Not Measured			--	29.6*
			5/1	75	35.8	--	28.0*

AHTANUM CREEK

Ahtanum R. S.	21C11	3100	Not Measured			0.0	0.0*
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# Not located directly on this drainage

++ 1953-67 period

\* Adjusted 1953-67 average

+ Snow water equivalent estimated from aerial stadia observation





## APPENDIX 5

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average ††

LOWER COLUMBIA DRAINAGEASOTIN CREEK

Spruce Springs	17C4	5700	4/30	72	29.5	26.2	--
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MILL CREEK

Tollgate	18D3M	5070	4/29	82	34.3	13.8	17.5
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KLICKITAT RIVER

Satus Pass	20D1	4030	4/30	0	0.0	2.5	--
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WHITE SALMON RIVER

Cultus Creek	21C12	4000	4/28	103	43.2	57.4	47.8*
#Surprise Lakes	21C13A	4250	4/28	99	45.1	59.3	50.5

WIND RIVER

Old Man Pass	21D19	3100	4/27	11	2.9	24.9	11.4*
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LEWIS RIVER

Blue Lake +	21C22a	4800	4/28	205	86.4	98.0	90.1*
Bob's Trail	21C21	2200	4/27	4	0.6	14.1	5.7*
Calamity Ridge +	22D1a	2500	4/27	3	0.4	4.6	--
Council Pass +	21C18a	4200	4/28	86	38.4	42.8	35.7*
#Cultus Creek	21C12	4000	4/28	103	43.2	57.4	47.8*
Divide Meadow +	21C29a	5600	4/28	145	62.4	61.4	61.6*
Grand Meadow	21C25	3500	4/28	39	16.6	22.8	22.2*
Lone Pine Shelter	21C26	3800	4/28	88	33.6	--	45.3*
Marble Mountain +	22C5a	3200	4/27	14	5.6	48.4	--
New Muddy River	22C6	1400	4/27	0	0.0	1.1	--
Old Man Pass	21D19	3100	4/27	11	2.9	24.9	11.4*
Plains of Abraham +	22C1a	4400	4/27	234	94.5	94.0	73.8*
Smith Creek Road	22C4	2100	4/27	0	0.0	14.8	--
Spencer Meadow +	21C20a	3400	4/27	13	3.2	26.0	13.0*
Surprise Lakes	21C12A	4250	4/28	99	45.1	59.3	50.5*
Table Mountain +	21C24a	4200	4/28	111	48.0	48.4	44.7*
Timbered Peak +	21D18a	3000	4/27	10	2.0	19.0	12.3*

+ Snow water equivalent estimated from aerial stadia observation

# Not located directly on this drainage

\* Adjusted 1953-67 average

++ 1953-67 period



## APPENDIX 6

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average ††

COWLITZ RIVER

Pigtail Peak	21G33	5900	5/1	148	67.5	--	--
#Plains of Abraham +	22C1a	4400	4/27	234	94.5	94.0	73.8
#White Pass (E. Side)	21C28	4500	5/1	64	29.1	29.0	26.2*
#White Pass (L. Lake)	21C27	4500	5/1	75	35.8	--	28.0*

PUGET SOUND DRAINAGEWHITE RIVER

#Morse Lake	21C17	5400	4/28	150	63.8	66.3	62.4
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GREEN RIVER

Snowshoe Butte SP	21B43SP	5000	5/1	148	60.0	70.5	--
Stampede Pass	21B10	3000	4/15	102	36.6	50.3	48.6
			4/30	109	45.5	56.3	46.0

SKYKOMISH RIVER

#Stevens Pass	21B1	4070	4/15	112	50.1	65.0	55.7*
			4/29	123	55.5	62.4	53.5
#Stevens Pass Sand Shed	21B45	3700	4/15	78	32.6	40.5	--
			4/29	83	36.0	38.4	--

SKAGIT RIVER

Beaver Creek Trail	21A4	2200	4/29	0	0.0	9.0	5.6*
Beaver Pass	21A1	3680	4/28	65	27.0	36.8	35.0
Brown Top +		6000	4/28	144	57.6	New Marker	
Devils Park	20A4	5900	4/29	103	41.5	44.6	49.2
Freezeout Cr. Trail	20A1	3500	4/28	29	10.1	6.2	8.3
Freezeout Meadows	20A2	5000	4/28	81	29.4	26.0	31.6
#Harts Pass	20A5A	6500	4/29	104	41.7	49.0	49.8
Lake Hozomeen	21A2	2600	4/28	13	8.0	5.9	5.8
Meadow Cabins	20A8	1900	4/29	0	0.0	0.0	2.0*
#Rainy Pass	20A9	4780	4/29	89	36.4	42.6	43.9
Thunder Basin	20A7	4200	4/29	63	23.2	26.8	26.9*

# Not located directly on this drainage

+ Snow water equivalent estimated from aerial stadia observation

\* Adjusted 1953-67 average

†† 1953-67 period





## APPENDIX 7

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average ††
<u>BAKER RIVER</u>							
Baker Pass +	21A27a	4900	4/15	165	69.3	--	--
			5/2	184	82.8	--	--
Dock Butte +	21A11A	3800	4/15	118	49.6	--	86.4
			5/2	128	58.6	81.8	87.1*
Easy Pass +	21A7A	5200	4/15	163	68.5	84.0	--
			5/2	192	85.2	88.3	107.4*
Jasper Pass +	21A6A	5400	4/15	206	86.5	95.4	102.6*
			5/2	190	81.4	99.3	113.6*
Komo Kulshan	21A17	800	5/2	0	0.0	0.0	--
Marten Lake +	21A9A	3600	4/15	142	59.6	82.8	92.3*
			5/2	153	69.5	89.2	93.3*
Mount Blum +	21A18a	5800	4/15	164	68.9	63.4	--
			5/2	162	72.9	--	--
#Panorama New	21A26	4300	4/13	142	66.2	80.8	--
			4/30	151	69.3	89.3	--
Rocky Creek +	21A12A	2100	4/15	3	1.5	36.9	31.8*
			5/2	16	7.1	33.7	20.4*
Schreibers Meadow	21A10A	3400	4/15	106	44.5	73.0	70.5*
			5/2	116	55.0	73.2	73.7*
S. F. Thunder Creek	21A14A	2200	4/15	0	0.0	--	--
			4/30	0	0.0	0.0	--
Sulphur Creek	21A13	1600	5/2	0	0.0	10.1	--
Three Mile Creek	21A8A	4500	4/30	0	0.0	0.0	--
Watson Lakes	21A8A	4500	5/2	137	60.6	84.8	--

NOOKSACK RIVER

Panorama New	21A26	4300	4/13	142	66.2	80.8	--
			4/30	151	69.3	89.3	--

OLYMPIC PENINSULADUNGENESS RIVER

Deer Park	23B4	5200	4/29	54	19.9	27.3	24.3*
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MORSE CREEK

Cox Valley	23B14	4500	4/30	95	38.1	56.1	--
Deer Park G. S.	23B13	4850	4/29	23	7.3	15.8	--

ELWHA RIVER

Hurricane	23B3	4500	4/28	53	17.9	35.4	28.0*
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+ Snow water equivalent estimated from aerial stadia observation

# Not located directly on this drainage

\* Adjusted 1953-67 average

†† 1953-67 period



## APPENDIX 8

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	No.	Elevation				Last Year	Average $\frac{1}{2}$

SKOKOMISH RIVER

Black & White	23B7	4200	4/28	79	30.2	--	--
Black & White Lakes	23B6	4700	4/28	134	61.8	--	--
Four Streams	23B10	3000	4/28	28	10.3	--	--
Home Sweet Home	23B5	5200	4/28	177	71.0	--	--
Sundown Pass	23B8	3900	4/28	128	55.4	--	--





# Agencies Assisting with Snow Surveys

## GOVERNMENT AGENCIES

### Canada:

Department of Lands, Forests and Water Resources,  
Water Resources Service, British Columbia

### States:

Washington State Department of Water Resources  
Washington State Department of Natural Resources

### Federal:

Department of the Army  
Corps of Engineers  
U. S. Department of Agriculture  
Forest Service  
U. S. Department of Commerce  
Weather Bureau  
U. S. Department of the Interior  
Bonneville Power Administration  
Bureau of Reclamation  
Geological Survey  
National Park Service

## PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.  
Pacific Power and Light Company  
Puget Sound Power and Light Company  
Washington Water Power Company

## OTHER PUBLIC AGENCIES

Okanogan Irrigation District  
Wenatchee Heights Irrigation District

## MUNICIPALITIES

City of Walla Walla  
City of Tacoma  
City of Seattle

*Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.*

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